

Attorney Docket No.: M3210.X1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS**

In re Application of:

Christopher H. Bajorek

Application No.: 10/659,006

Filed: September 9, 2003

For: ISOTHERMAL IMPRINTING

Examiner: Matthew J. Daniels

Art Unit: 1791

Confirmation No.: 3505

Assistant Commissioner For Patents
Board of Patent Appeals and Interferences
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY BRIEF
TO EXAMINER'S ANSWER

Pursuant to 37 C.F.R. § 41.41, and in response to the Examiner's Answer dated July 20, 2009, Appellant submits the attached Reply Brief.

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I. STATUS OF CLAIMS

Claims 1-16, 18, 19 and 22-25 are currently pending in the above-referenced application. Claims 17, 20 and 21 have been cancelled.

Claims 1-16, 18, 19 and 22-25 were finally rejected in the Final Office Action mailed January 22, 2009. These claims are the subject of this Appeal.

An Appeal Brief setting forth arguments countering the rejection of these claims was filed April 20, 2009.

An Examiner's Answer was mailed July 20, 2009 which withdrew certain grounds of rejection while maintaining other grounds of rejection for the claims 5-7, 9, 10, 12, 13, 16, 19, and 22-25.

II. GROUNDINGS OF REJECTION TO BE REVIEWED ON APPEAL

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

- A. Claims 1, 2, 8 and 25 were rejected under 35 U.S.C § 102(b) as being anticipated by Krauss (Ph.D. Dissertation, entitled *Nanostructure Engineering: Quantized Magnetic Disk and Nanoimprint Lithography*, hereinafter “Krauss”).

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

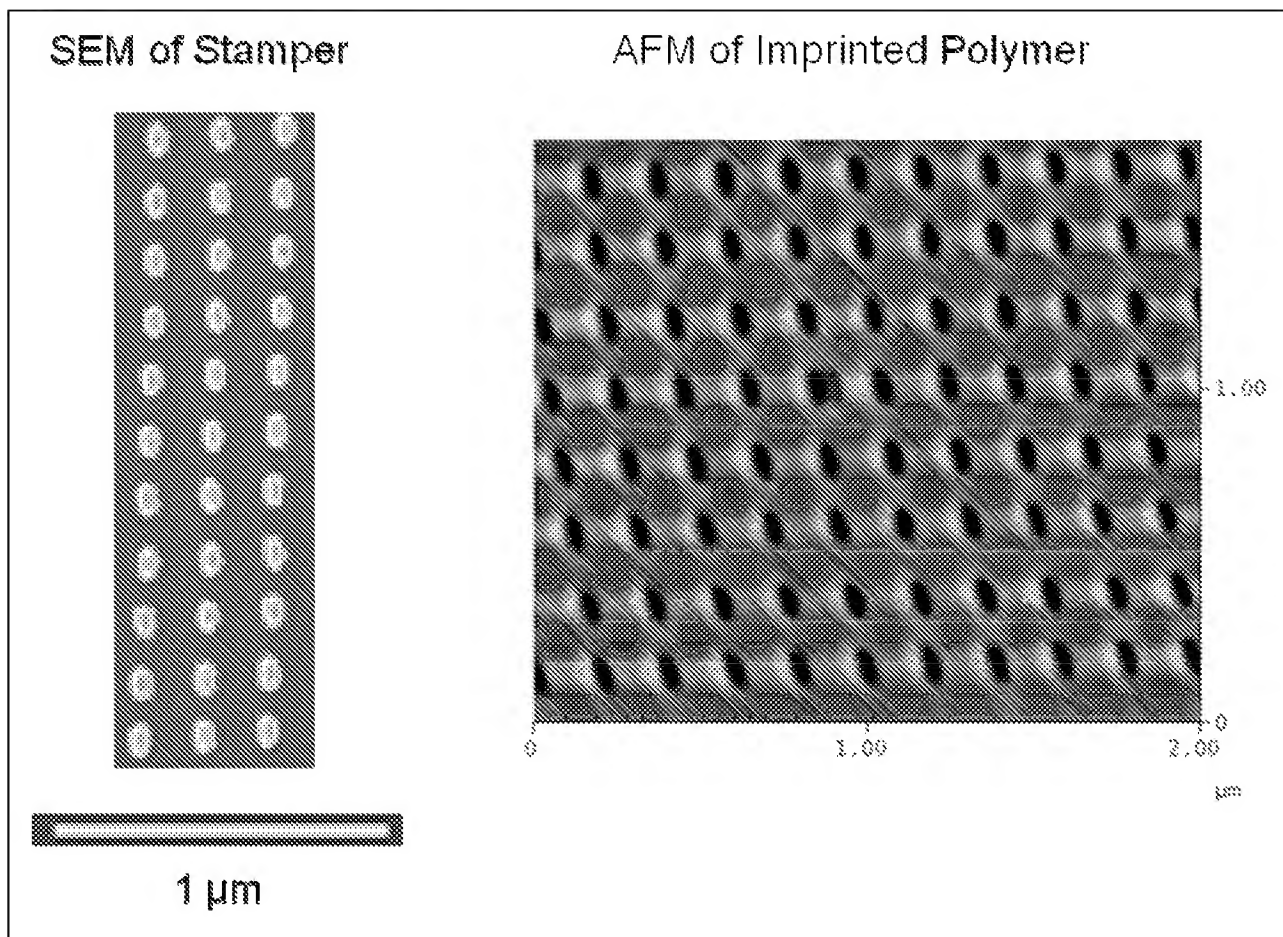
- A. Claims 1, 2, 8, 11, 12, 18, 22 and 25 were rejected under 35 U.S.C §103(a) as obvious over Davis.
- B. Dependent Claim Rejections
- 1) Claims 3, 4, 10, 11, 12 and 13 were rejected under 35 U.S.C. §103(a) as obvious over Krauss.
 - 2) Claims 3-6 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou’216.
 - 3) Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou’216, further in view of Chou’580.
 - 4) Claims 9 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Colburn, *Development and advantages of step-and-flash lithography* (Solid State Technology, 44(7) July 2001).
 - 5) Claims 10 and 13-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Davis.
 - 6) Claims 23 and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Davis in view of Chou’216, Chou’580 and Chen.

III. TABLE OF AUTHORITIES

None.

IV. STATEMENT OF ADDITIONAL FACTS

Appellant submits the figure below as facts necessary to address points raised in the Examiner's Answer. Particularly, the figure below is the figure referenced by the Treves declaration (filed October 31, 2008) and is provided here in response to the Examiner's point made on p. 20 of the Answer which states, in part, "it is unclear whether there is sufficient proof to support the conclusion set forth"



V. **ARGUMENT**

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

A. Claims 1, 2, 8 and 25 were rejected under 35 U.S.C § 102(b) as being anticipated by Krauss (Ph.D. Dissertation, entitled *Nanostructure Engineering: Quantized Magnetic Disk and Nanoimprint Lithography*, hereinafter “Krauss”).

B. Appellant’s Reply

The Examiner alleges Krauss discloses two alternative cooling cycles “used with the same heating and imprinting steps ... for at least the reasons that they are described in the same paragraph and Krauss fails to set forth any different heating and imprinting conditions for the two alternative cooling cycles.” (Reply p. 14)

Appellant replies that the rejection is in error because Krauss’ disclosure lacks sufficient specificity to infer that the heating and imprinting operations of p. 82, line 17-p. 83 line 10, which are described in the limited context of a successful imprinting method, are also applicable to the unsuccessful separation condition described in Krauss, p. 83, lines 10-12. As Appellant has claimed an imprinting method and not merely a separation condition, the separation condition relied upon by the rejection, whether or not disparaged by Krauss, does not anticipate the claims.

Appellant submits that a description of two separation conditions provided in a same paragraph is not dispositive of the two conditions having the same preceding operations. Within the single paragraph, the transitional clauses provided in each sentence particular to the coherent imprinting method (e.g., “during,” “next,” “following”) effectively distinguish operations of the successful imprinting method (which cools before separation) from the failing separation condition relied upon by the rejection. As such, Krauss distinguishes the disclosed heating and imprinting

operations as part of a single coherent method while Krauss only generally describes cooling after separation to be inoperable without disclosing what specific heating and imprinting conditions precede the failing condition.

Furthermore, a description of two separation conditions without specifically setting forth two different heating and imprinting conditions is also not dispositive of the two separation conditions sharing the same preceding steps. Contrary to the Examiner's allegation, Appellant submits one of ordinary skill in the art would interpret the single statement describing the failing separation condition to indicate that cooling after separation was inoperable under any and all heating and imprinting conditions and so the absence of a description of the specific heating and imprinting conditions for such a separation condition is moot. Thus, Appellant submits Krauss's silence with respect to alternative heating and imprinting conditions specific to the failing condition does not sustain the Examiner's inference that the failing separation condition was "with the same heating and imprinting steps."

Appellant therefore maintains the position that the heating and imprinting operations preceding the failing separation condition are insufficiently disclosed by Krauss to pertain to a same method to anticipate the instant claims.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

A. Claims 1, 2, 8, 11, 12, 18, 22 and 25 were rejected under 35 U.S.C §103(a) as obvious over Davis.

B. Appellant's Reply

1) The Examiner's Answer cites paragraph [0073] of Davis and emphasizes the claim recites "approximately a glass transition temperature" in an apparent effort to support the assertion:

when the substrate is cooled to the temperature of a mold [that is only a few degrees below the glass transition temperature] and separated, it meets the claim language 'before the resist film is cooled below approximately a glass transition temperature of the resist film' since the interpretation of 'approximately a glass transition temperature' in this case should include at least a few degrees below the glass transition temperature. (Answer, pp. 16-17)

Appellant submits the Examiner's admission that Davis discloses a mold below the transition temperature which is "used to cool the substrate to the temperature of the mold" (Answer p. 17) renders moot any question of whether a "few degrees below the glass transition temperature" satisfies a proper interpretation of the claim language "approximately a glass transition temperature." Because the Davis mold cools the substrate to at least a few degrees below the glass transition temperature, Applicant submits the claim 1 feature of "cooling the resist film below the glass transition temperature **after** separating" (*emphasis added*) cannot also be satisfied either inherently as the rejection asserts, or otherwise. This point of the Examiner's answer is therefore inconsistent with the rejection.

2) The Examiner's Answer further asserts that paragraph [0076] and [0078] contradict the Appellant's interpretation that one of ordinary skill would understand a temperature of the mold might be "maintained" until a substrate is to be removed,(Answer, p. 18) and that Davis "provides specific guidance with respect to the mold temperature and substrate/resist temperature, which constitute result effective variables." (Answer, pp. 18-19)

Appellant replies that the only mold temperatures described in Davis paragraph [0076] are below the glass transition temperature and therefore do not contradict Appellant's position. Appellant maintains that Davis paragraph [0076] explicitly teaches that with a mold at a temperature below the glass transition temperature, "the time required for heat-up and cool-down of conventional embossing processes is significantly diminished." (paragraph [0076]).

Appellant further replies that Davis paragraph [0073] merely provides an introduction to a molding process and provides temperature ranges covering those conventional in the art where a mold may be heated to well above a glass transition temperature (+30 C). However, one of skill in the art would appreciate that Davis paragraph [0075] explains that for such hot mold conditions the molded substrate is cooled to below the glass transition temperature before removal from the mold. Thus, Appellant submits the Examiner's rejection inappropriately mixes methods in Davis where a cold mold (below the glass transition temperature) that is not cooled further (e.g., "maintained") before opening is mixed with distinct methods where a hot mold (above the glass transition temperature) is cooled before opening.

Davis paragraph [0078] discloses a generalization that "by maintaining the mold below or slightly above the glass transition temperature ... cycle time can be reduced." Appellant maintains the position that this general statement is properly interpreted to be consistent with the specific statements made in paragraphs [0073]-[0077]. Therefore, for the goal of reduced cycle time in view of a need to optimize replication and release, the "maintaining" described in paragraph [0078] is properly understood to teach that with the mold near T_g , the mold either doesn't need any cooling/heating time (if maintained

below Tg) or can be more quickly cooled to below the glass transition temperature (if maintained only slightly above Tg) prior to removal from the mold.

3) The Examiner asserts the Treves declaration of “some unrecognized shear distortion problem” is not sufficient to distinguish the claimed invention because Davis teaches mold temperatures and substrate/resist temperatures substantially the same as those claimed. (Answer p. 19)

Appellant first maintains that the Examiner has failed to make a *prima facie* case of obviousness based on the Davis reference. In particular, the Examiner’s own assertion that:

when the Davis substrate is cooled to the temperature of a mold and separated, it meets the claim language ‘before the resist film is cooled below approximately a glass transition temperature of the resist film’ since the interpretation of ‘approximately a glass transition temperature’ in this case should include at least a few degrees below the glass transition temperature (Answer, p. 17)

is inconsistent with the rejection asserting that the claimed ‘cooling the resist film below the glass transition temperature after the separating’ is “inherent in that other operations are subsequently performed” (Answer, p. 7, *emphasis added*). Appellant submits that this inconsistency highlights how the Examiner’s rejection improperly reads out elements of claim 1.

4) The Examiner alludes to a distinction between a declaration of an “unexpected result” and a declaration of an “unexpected process” (Answer p. 19) and further alleges, “it is not clear how the claimed process can be considered an unexpected result where no particular size range is claimed.” (Answer p. 20)

Appellant replies that the Examiner appears to be arguing semantics where there is no substantive distinction. Appellant submits it is non-probative whether a declaration is phrased as “it was a surprise process x resulted in result y” or phrased as “it was a surprise result y resulted from process x.” In either case, the unexpectedness lies in the result achieved by the process claimed.

5) The Examiner’s answer indicates that a figure referenced in the declaration is absent from the record. (Answer, p. 20)

In reply, the figure, as described in the declaration, is provided in the Statement of Additional Facts section of this reply brief.

In conclusion, Appellant respectfully submits that all appealed claims in this application are patentable and requests that the Board of Patent Appeals and Interferences reverse the Examiner’s rejections and direct allowance of the rejected claims.

Appellant believes that no fee is required for consideration of this reply brief, as the fee of \$540.00 to cover the appeal fee for one other than a small entity as specified in 37 C.F.R. §1.17(c) was submitted with the originally filed appeal brief. Please charge any shortages and credit any overcharges to our Deposit Account No. 02-2666.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN, LLP

September 18, 2009
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